

Amendments To The Claims

1. (Currently Amended) A method of forming a photonic crystal material, said method comprising exposing a film of a photosensitive material composition to an a three-dimensional interference pattern of electromagnetic radiation of a predetermined wavelength whereby the exposure through the material photosensitive film varies in accordance with the spatially three dimensionally varying intensity created by the interference to produce a three dimensional periodic variation in the refractive index of the photosensitive material film based on the exposure, wherein the photosensitive material film comprises a first component which is a polymerisable material possessing an average number of crosslinkable groups per molecule of at least 3 with an equivalent weight per crosslinkable group of at most 1000, and a second component which is a photoacid generator; the photosensitive film has a thickness of 10 to 100 micrometers, and wherein the first component of the photosensitive composition is selected so as to have a low degree of optical absorption at said predetermined irradiating wavelength and for said thickness range of said photosensitive film, and the photoacid generator is selected such that not more than 5% of the radiation of said predetermined wavelength incident upon the photosensitive film of said thickness range is absorbed therein.

2. (Currently Amended) A method according to claim 1, wherein the irradiated sample film of said photosensitive material composition is developed to remove less irradiated regions of the sample film.

3. (Currently Amended) A method according to claim 1 wherein the first component of the photosensitive material composition is an epoxy resin.

4. (Previously Presented) A method according to claim 1 wherein the number of crosslinkable groups per molecule is at least 6.

5. (Original) A method according to claim 4 wherein the number of crosslinkable groups per molecule is about 8.

6. (Previously Presented) A method according to claim 1 wherein the equivalent weight per crosslinkable group is at most 300.

7. (Original) A method according to claim 6 wherein the equivalent weight per crosslinkable group is at most 230.

8. (Currently Amended) A method according to claim 1 wherein the first component of the photosensitive material composition is a glycidyl ether of bisphenol A novolac resin.

9. (Original) A method according to claim 8 wherein the resin is one where the number of epoxy groups per molecule is about 8 and the resin is co-polymerised with a less crosslinkable plasticising epoxy monomer.

10. (Cancelled)

11. (Currently Amended) A method according to claim ~~40~~ 1 wherein the photoacid generator possesses a molar extinction coefficient of 50 to 2000 mol⁻¹ dm³ cm⁻¹ at the irradiating wavelength of radiation being used, and is used at a concentration at which it does not absorb more than 5% of the radiation which is incident upon it while having a quantum efficiency which is sufficient for the exposure to cause insolubilisation of the photosensitive material.

12. (Original) A method according to claim 11 wherein the molar extinction coefficient is 100 to 500 mol⁻¹ dm³ cm⁻¹.

13. (Previously Presented) A method according to claim 11 wherein the photoacid generator is a triaryl sulphonium salt.

14. (Currently Amended) A method according to claim 1 wherein the photosensitive ~~material~~ film is cured by subsequent heating to cause acid catalysed polymerisation.

15. (Currently Amended) A method according to claim 14 wherein the photosensitive ~~material~~ film is cured by heating at 40°C to 120°C for 1 to 20 minutes.

16. (Currently Amended) A method according to claim 14 wherein the heating is carried out at a temperature below the melting point of the photosensitive ~~material~~ composition.

17. (Currently Amended) A method according to claim 2 wherein material is introduced into the voids produced by development of the irradiated photosensitive ~~material~~ film.

18. (Currently Amended) A method according to claim 17 wherein the optical properties of the irradiated ~~sample~~ film are adjusted by the introduction of a material having a predetermined refractive index that is different from that of the irradiated photosensitive ~~material~~ composition.

19. (Currently Amended) A method according to claim 17 wherein the irradiated ~~sample~~ film is used as a template for the production of other composite materials having periodic variations in refractive index.

20. (Currently Amended) A method according to claim 1, wherein the photosensitive ~~material~~ film is subjected to multiple exposures, each exposure producing respective interference patterns.

21. (Currently Amended) A method according to claim 1, wherein the three dimensional pattern is formed by directing electromagnetic radiation from at least

four beams at the photosensitive material film so as to intersect and interfere within it.

22. (Previously Cancelled)

23. (Previously Cancelled)